

CLAIMS

1. A device and process for introducing state changes in athletic activities which comprises:

(a) A battery powered electronic device in a suitably durable casing which contains an embedded microprocessor based controller utilizing a program loaded from read only memory to maintain multiple internal logical states whose combined values define the device state. The controller and its program provide: a means for reading the device settings from switches and dials interfaced to the controller; a means for varying the device state over time; a means for selecting either periodic or randomly timed transitions between device states; a means for generating (pseudo)random numbers; a means for selecting either periodic or randomly timed transitions between device states; a means for selecting either ordered or random progression through the available device states; a means for varying the mean transition frequency between device states; a means for varying the hold time (the minimum time a device state is maintained); a means for varying the relative mean time spent in each device state (device state occupancy); and a means for displaying the device state on sets of colored light emitting diodes (LEDs) interfaced to the controller, for transmission to the athletes.

(b) The process which comprises one or more athletes reading the device state information from the display of one or more of the devices in (a) and interpreting this information within the environment of an athletic training session or an actual game as a local or global change in that environment. Example of a local change: pass the ball to the left of this device. Example of a global change: goal shots are now allowed.

- (c) The device of (a) where the controller and/or display means are mechanical.
- (d) The device of (a) where the controller and/or display means are electromechanical.
- (e) The device of (a) where the controller is electrical.
- (f) The device of (a) where the controller is built from electronic components other than a microprocessor.
- (g) The device of (a) where the local dials and switches are supplemented or replaced by a separate remote control which sends device settings to the controller, which in turn stores and maintains these settings until they are once again changed by the remote control.
- (h) The device of (a) where the periodic signals are generated by an oscillator external to the controller.
- (i) The device of (a) where the generation of random numbers and/or time points is accomplished by measuring physical processes (shot noise, radioactive decay, etc.)
- (j) The device of (a) where the device state is displayed to the athletes by optically active devices other than LEDs, including, but not restricted to, liquid crystal displays, cathode ray tubes, and fluorescent and incandescent bulbs.
- (k) The device of (a) where the device state is presented to the athletes on an alphanumeric ("Pass on left") or symbolic (an arrow pointing left) display.
- (l) The device of (a) where the device state is transmitted to the athletes as one or more simple sounds (bells, beeps, buzzes and the like, singly or in combination, simultaneously or in sequence.)
- (m) The device of (a) where the device state is transmitted to the athletes as a synthesized sound including especially synthesized speech.

- (n) The device of (a) where the device state is transmitted to the athletes as a recorded sound including especially recorded speech.
- (o) The device of (a) where the device state is transmitted to a receiver worn by the athlete, attached to an article of athletic apparel or equipment, or simply carried by the athlete, which displays the device state information for the athlete as in (a) and (j) through (n).
- (p) The device of (a) where the controller means are physically separate from, and distant from, the display means, with communications between the two parts via wire, fiber optics, electromagnetic radiation, or sound waves. Example: multiple devices distributed around a large field all displaying the same game state information sent from a single controller.
- (q) The device of (p) where different portions of the device state (here referring to the device composed of the controller and all remote displays) are presented on specific remote display units. Example: multiple goals in a complex field game are set individually to indicate whether or not a shot on that goal is allowed.
- (r) The device of (p) where multiple remote display units are activated sequentially in a predefined or randomly selected order so as to present a localized device state change that moves in a one, two, or three-dimensional pattern across a playing area. Example: an athlete on a field containing numerous soccer cones incorporating the display moves to “guard” the single active cone, where the order in which the cones are lit simulates the motions of a moving offensive player.

(s) The device (p) where communications from a coach, referee, or other player are relayed through the field devices along with the device state to the display units, and where such communications may be selectively targeted to any subset of the devices or broadcast to all of them. Example: a coach seated high in a stadium first broadcasts a message to all players to begin a different type of drill and then directs comments to individual players during the course of that drill.

(t) The devices of (a) through (s) where battery power is supplemented by or replaced with solar power and/or line power.